

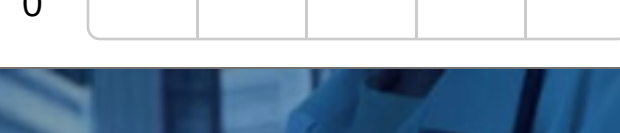
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Newborns Exposed to Endocrine Disruption + More Microbiome Science, Please + More

The Defender's Weekly Science Digest delivers a roundup of the latest research on children's health, including studies on vaccines, drugs, chemicals, pesticides and lead exposure.

By Angelo DePalma, Ph.D.



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Even newborns can't escape plastic contaminants

Measurement of Bisphenol A Diglycidyl Ether (BADGE), BADGE derivatives, and Bisphenol F Diglycidyl Ether (BFDGE) in Japanese infants with NICU hospitalization history; [BMC Pediatrics](#), Jan. 8, 2024.

Bisphenol A diglycidyl ether (BADGE) and Bisphenol F diglycidyl ether (BFDGE) are plastics used to construct [intravenous sets](#), syringes, catheters and other single-use equipment used in hospitals.

To quantify neonatal exposure to BADGE and BFDGE investigators enrolled 10 infants admitted to the [neonatal intensive care unit](#) (NICU) and analyzed their blood at 1-2 months and 7 months after their discharge. The researchers also surveyed the infants' parents about their diet and home environment.

One form of BADGE, BADGE-2H2O was found at various concentrations in all infants at both time points. However, blood values were lower at 7 months. Researchers could not detect BADGE-H2O, BADGE and BFDGE at either time point.

One of two children who received mechanical ventilation showed “substantially increased” levels of the plastic BADGE-2H2O. There was no significant difference between children who ate commercial baby food at least once per week and those who did not.

Studies have shown that BADGE and BFDGE [disrupt the endocrine system](#) and are toxic to both [genes](#) and [cells](#). Endocrine disruption was of particular concern to researchers for its potential to affect [newborn growth and development](#).

More microbiome science, please

Boosting microbiome science worldwide could save millions of children's lives; [Nature](#), Jan. 8, 2024.

Promoting microbiome science beyond its current European and North American leanings could save millions of children's lives per year, according to a study in Nature.

The [human microbiome](#) is the collection of bacteria, viruses, yeast, fungi and other microorganisms that inhabit our bodies.

Although Europe and the U.S. make up just 15% of the world's population they are the subjects of 70% of published human microbiomes and about 85% of the high-quality microbiomes of children under age 4.

Just one component of the human microbiome, the [gut microbiome](#), has been implicated in both beneficial and harmful events — for example, heart disease and [inflammation](#).

Scientists are working on [drugs that target the microbiome](#), but because microbiomes vary regionally the [drugs](#) must be designed for specific populations. If world health authorities pursue this tack, 17 million children's lives could be saved each year.

Low vitamin A levels linked to increased risk of respiratory infections

Recurrent respiratory tract infections in children might be associated with vitamin A status: a case-control study; [Frontiers in Pediatrics](#), Jan. 5, 2024.

A Chinese study found that the less vitamin A in a child's bloodstream the greater their risk for having [recurrent respiratory tract infections](#) (RRTIs).

Investigators recruited 2,592 children ages 6 months to 14 years from China's Heilongjiang province. Parents completed a diet questionnaire on behalf of 1,039 children experiencing RRTIs and 1,553 who did not.

Blood concentrations of vitamin A in the RRTI group were significantly lower than for healthy control subjects. Children with moderately low vitamin levels had a 32% higher chance of being in the RRTI group, and those who were seriously deficient were 50% more likely.

Among children with respiratory tract infections on the day they entered the study, those with moderately low vitamin A were 48% more likely to have started in the RRTI group, and those with severely low levels were 5.5 times more likely.

Children with low intake of [vitamin A-rich foods](#) (carrots, spinach, broccoli and meat, especially organ meats) also had a lower incidence of RRTIs.

Autism associated with inflammation

Evaluation of serum interleukin-17 A and interleukin-22 levels in pediatric patients with autism spectrum disorder: a pilot study; [BMC Pediatrics](#), Jan. 5, 2024.

Egyptian investigators found a connection between elevated levels of [interleukin-17 A](#) (IL-17A) and [interleukin-22](#) (IL-22), [cytokines involved in systemic inflammation](#), in children with autism spectrum disorder (ASD).

The group enrolled 24 children with ASD (median age 5.25) and 24 non-autistic controls (age 6).

Combined elevated cytokine levels strongly associated with an ASD diagnosis and IL-22 levels predicted ASD severity. But when the cytokines were analyzed together no link emerged between IL-17A plus IL-22 levels and ASD symptom severity.

Children with pre-existing inflammatory or allergic diseases were excluded from the study as they likely already had high cytokine levels.

The authors were attempting to establish the cytokine-ASD link to lay the groundwork for the discovery of future ASD treatments targeting [inflammatory processes](#).

However, they note that factors like breastfeeding and [gut microbiome composition](#), which were not controlled in their study, could also contribute to the [development of ASD](#).

Why some kids are more vulnerable to mercury exposure

Factors associated with blood mercury concentrations and their interactions with three glutathione S-transferase genes (GSTT1, GSTM1, and GSTP1): an exposure assessment study of typically developing Jamaican children; [BMC Pediatrics](#), Jan. 4, 2024.

Mercury exposure through consumption of canned fish and plant [foods](#) high in mercury leads to higher-than-normal blood mercury levels — but this effect is most pronounced in children carrying one specific gene.

U.S. and Jamaican researchers enrolled 375 typically developing 2- to 8-year-olds to explore the association between the consumption of canned fish (a staple of Jamaican diets), starches, grains and beans — sources of mercury exposure — and blood-mercury concentrations.

The only significant difference among subjects was which version of the GST ([glutathione S-transferase](#)) gene they carried.

GST is an enzyme that helps the body eliminate mercury, lead and other dangerous heavy metals. Some variants of this gene are more effective than others.

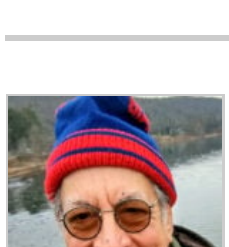
The researchers found that the consumption of canned sardines and mackerel significantly raised blood mercury concentrations, but only among children with two specific GST variants. Humans express eight different families of GST and dozens of subvariants.

By identifying subgroups of children most likely to experience the [ill effects of mercury exposure](#), the study points toward future [mercury exposure](#) studies that concentrate on this particularly vulnerable population.

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Angelo DePalma, Ph.D., is a science reporter/editor for The Defender.

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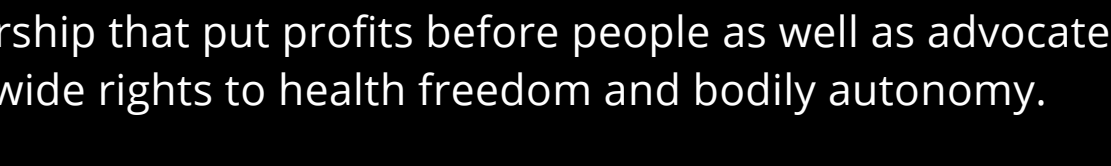
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